NOTE XII.

ON A NEW CUBOMEDUSA FROM THE JAVA-SEA: *CHIROPSALMUS BUITENDIJKI*

BY

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(With plate 2).

Some time ago Mr. P. J. Buitendijk, who enriched our collections already with many valuable objects, presented to our Museum three excellently preserved specimens of a Cubomedusa, belonging to the genus *Chiropsalmus*. As far as I know, hitherto only two species of this remarkable genus are described, viz. *Ch. quadrumanus* (*Tamoia quadrumana*), observed by Fritz Müller in the sea near Santa Catharina (Brazil)[1], afterwards also found by Wilson near Beaufort (North-Carolina)[2] and *Ch. quadrigatus*, based by Häckel upon a single specimen, that was collected by Thallitzer at the coast of Rangoon[3]. Unfortunately the last specimen was in an indifferent state of preservation, so Häckel was unable to give a detailed description of it; nevertheless I think it elaborate enough to conclude, that our individuals belong to another species, that, in honour of its discoverer, may be named *Ch. Buitendijki.*

Like the specimens of *Chiropsalmus quadrumanus* those of *Ch. Buitendijki* were met with in the vicinity of the shore, in the road of Batavia; they have no colour, but are transparent, gelatinous, the tentacles only have a rosy hue.

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[1] Abhandl. der Naturf. Gesellschaft zu Halle, Bd. V, 1860, p. 3, pls. 2 and 3.

[2] F. S. Conant, the Cubomedusae; Memoirs f. the Biol. Labor. of the John Hopkins University, IV, 1898, p. 4.

[3] Das System der Medusen, 1879, p. 447.

The bell (fig. 1) has the shape, commonly seen in Cubomedusae, of a cube with a rather arched roof and is nearly as broad as high, 65 to 70 mm.; its lateral sides as well as the ribs are somewhat rounded. However the last ones in their inferior part, where they are passing into the pedalia, are prominent and edged. In the upper part of each lateral area, just beneath the roof, two large semilunar spots (fig. 1, *pa*) are to be seen, lying opposite to each other; they have the appearance of orifices, but are in reality the solid bases of the pocket-arms. Moreover each lateral side shows two adradial furrows, situated in the middle between the sensory-bodiës and the pedalia, that sett off an arched median area from two lateral ones; these furrows do not extend over the total height of the bell, but reach from about the level of the bases of the pocket-arms till the region of the sensory-bodies. Also the interradial ribs are provided in their superior part with a shallow groove. From the base of each rib springs a pedalium (fig. 1, *pe* and fig. 4), that has the shape of the blade of a knife or sickle, measuring in length about half the height of the bell; it bears upon its outer edge 5 to 6 (in one specimen even 7) also laterally compressed, knife-shaped branches, that are diminishing in length from its proximal till its distal extremity,. and which have attached at their end the tentacles. The main axis of the pedalium as well as its lateral continuations are hollow and contain a canal, that communicates with the gastro-vascular system; at its origin the main canal is furnished with an elongated, cap-shaped diverticulum, that ends blind in the base of the rib. The tentacles have a ringed appearance, being surrounded by alternate broad and narrow bands, which contain large and small thread-cells; I am unable to mention their real length, because none of the tentacles was complete.

The sense-organs (rhopalia), situated at a short distance above the margin of the bell, lie protected in an ellipsoidal niche of the exumbrella, under a hood-like projection of its upper margin (figs. 1, 2, *sn* and fig. 3); the longest axis of the niche measures 5 mm., the shortest one 2 mm. in length. Each organ (fig. 5) consists of a hollow stalk and a retort-shaped swelling, that at its inferior part bears a sac, wherein are contained the statoliths; I could not recognize these concretions, probably they were dissolved by the action of the formaline. Along its median border the sensory club bears two complicated, unpaired eyes, a large one and a smaller one above it, both provided with a lens and pigmented cup; moreover on each side of the club there lies a pair of small, simple eye-spots.

The opening of the bell-cavity is surrounded by a velarium (fig. 1, *ve*), suspended by the four frenula (fig. 2, *fr*); its breadth measures about a third of the height of the bell. The diverticula of the gastro-vascular system, contained in it, are much branched. Each quadrant of the velarium possesses four of these canals of different shape (fig. 6, *vc*). The diverticulum, situated next to the frenulum, extends till the margin of the velarium and bears only along its outer border some large dendritical canals, shaped like a coral-tree; that situated next to the pedalium is in its origin much broader than the foregoing, but already in the middle of the velarium it divides into a great number of branches. Above, the bell-cavity is roofed over by the stomach (fig. 2, *st*), having about the shape of a saucer; it communicates with the stomach-pockets in the lateral sides of the bell by means of the four gastric ostia (figs. 1 and 2, *go*), that are seen in a side-view of the medusa like a small circular area, lying between two larger ones (the bases of the pocket-arms). Each ostium is guarded by a kind of valve, consisting of a knob-like protuberance of the exumbrella. Like as in *Chiropsalmus quadrumanus* the phacelli (fig. 2, *ph*) are placed in a horse-shoe-shaped group, turned with its concave side downward; they consist of a great number of densely crowded gastral filaments, having a length of 3 mm. Moreover the wall of the stomach shows a series of besom-shaped folds, which diverge featherlike from each side of a groove, that forms a continuation of the furrow of the mouth-lobes towards the gastric ostia. From the stomach there hangs down in the bell-cavity the manubrium (fig. 2, *ma*), consisting of a short funnel-shaped stalk, that bears at its distal end four tongue-shaped mouth-lobes; each lobe consists of two halves, including between them a furrow, that forms the beginning of the perradial stomach-groove, above referred to. By means of the gastric ostia the stomach communicates with four broad, thin pouches, lying between the exumbrella and the subumbrella, and separated from one another in the interradii, the stomach-pockets (fig. 2, *sp*); downward they pass into the marginal pockets, which in their turn are in continuation with the velar-canals. From the upper part of these pockets emerge the curious, fingerlike diverticula, that, like the fingers of a glove, are extending around equally shaped outgrowths of the exumbrella in its adradial region and hang down in the bell-cavity nearly till the opening (fig. 2, *pa*); these pocket-arms, as they are called by Häckel, show a longitudinal folding, that in their inferior part takes a more transverse direction. The allied genus *Chirodropus*, according to Häckel [1]), is charakterized by having within each stomach-pocket two arm-like outgrowths, the inferior part of which is branched in numerous filaments »die sich ganz gleich den Gastral-filamenten anderer Cubomedusen verhalten"; therefore they are considered by the named author as modified vestiges of the four umbraltaeniolae of *Tessera* [2]). I have some serious doubt whether the pocket-arms of *Chiropsalmus*, that possesses normal phacelli like as other Charybdaeidae, should have this morphological

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1) loc. cit. p. 447, pl. XXVI.
2) loc. cit. p. 430.

meaning; perhaps the embryology afterwards will throw some light upon this question, but presently I can only state that they are in connection with the reproductive system. For each stomach-pocket contains a pair of the leaf-like reproductive organs (fig. 2, *ro*), that are attached to their interradial border; these leaves, that are nearly triangular shaped and partially folded, do not reach laterally the perradius and extend downward till on a short distance above the frenula. But they extend themselves into the pocket-arms and produce the folded appearance of these organs. The examined specimen was a male.

I do not think that our specimens can be identified with either of the two species already described.

By the following table the three species may be distinguished:

A. Umbrella bell-shaped, almost semiglobular.
    Pedalia with 10 to 11 branches . . . . . . *Chiropsalmus quadrumanus* Müll.
    (East-coast of America).
B. Umbrella nearly cuboid, arched above.
    Pedalia with less as 10 branches.
    a. Pocket-arms ovoid, hardly a fourth of the length of the lateral pockets. Pedalia with 4 branches. . . . . *Chiropsalmus quadrigatus* Häck.
    (Coast of Rangoon).
    b. Pocket-arms finger-shaped, nearly as long as the lateral pockets. Pedalia with 5 to 6 branches. . . . . . . *Chiropsalmus Buitendijki*, n. sp.
    (Road of Batavia).

REFERENCE LETTERS.

eu = exumbrella.
fr = frenulum.
go = gastric ostium.
ma = manubrium.
pa = pocket-arm.
pe = pedalium.
ph = phacellus.
rh = rhopalium.
ro = reproductive organ.
sn = sensory niche.
sp = stomach-pocket.
st = stomach.
su = subumbrella.
vc = velar canal.
ve = velarium.

EXPLANATION OF THE PLATE.

Fig. 1. *Chiropsalmus Buitendijki*, from one of the perradial sides; × $^{3}/_{4}$ diam.

Fig. 2. The same cut in halves vertically through a perradius; nat. size.

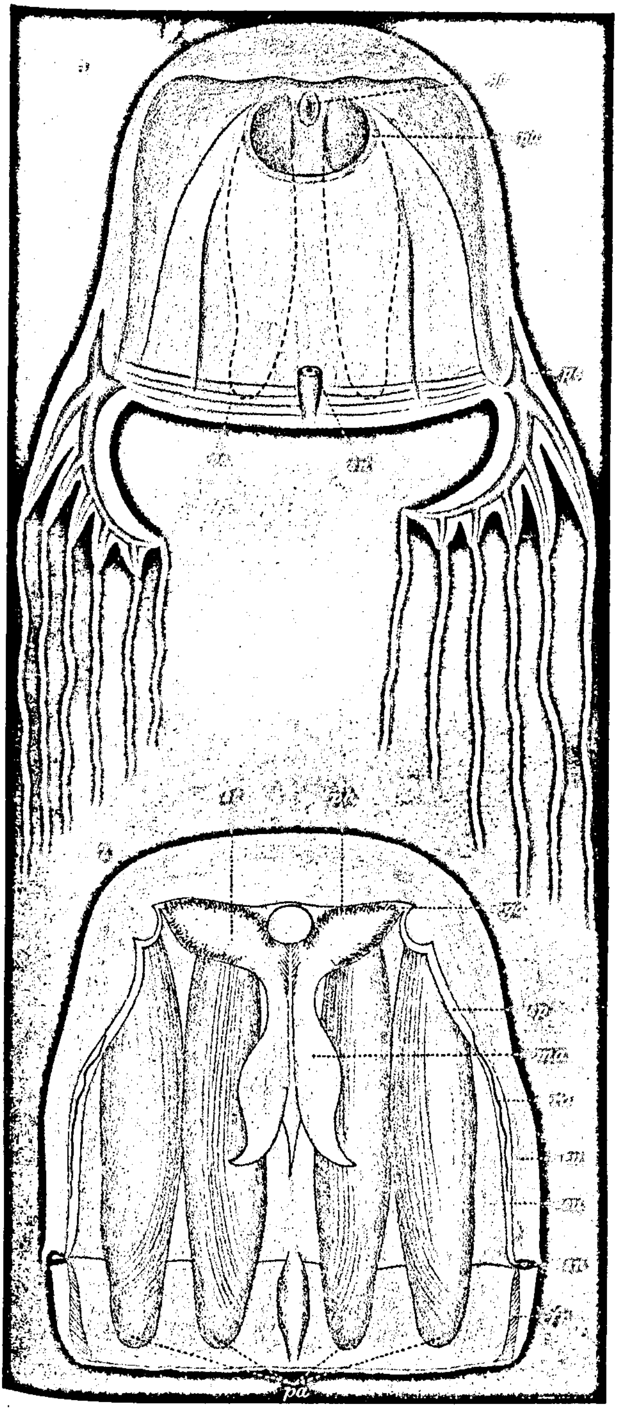
Fig. 3. A sensory niche with the rhopalium; × 4 diam.

Fig. 4. A pedalium; nat. size.

Fig. 5. A rhopalium or sensory club; magnified.

Fig. 6. Surface-view of a velarium-quadrant to show the shape of velar canals; × $^{4}/_{3}$ diam.

Leyden, May 1907.



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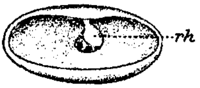

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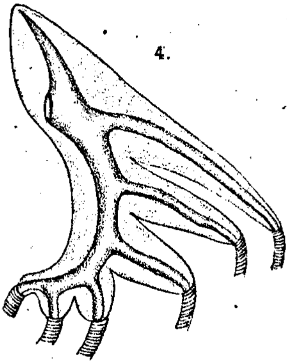

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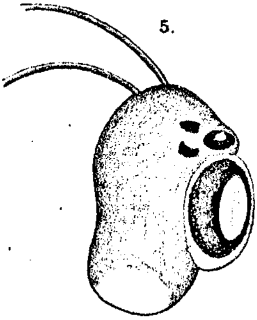

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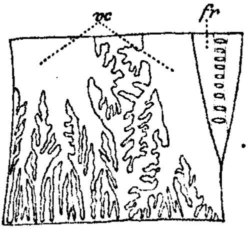

R. Horst del. Firma P. W. M. Trap impr.

Chiropsalmus Buitendijki, n. sp.